

REMARKS

Claims 1, 31, 61-64, 66, 67, 69-72, 74, 75, 77-79, 81, 82, and 84-90 have been amended. Claims 1-4, 6, 7, 9-12, 14, 15, 17-19, 21, 22, 24-34, 36, 37, 39-42, 44, 45, 47-49, 51, 52, 54-64, 66, 67, 69-72, 74, 75, 77-79, 81, 82 and 84-90 remain pending in the application. Reconsideration is respectfully requested in light of the following remarks.

Section 112, Second Paragraph, Rejection:

The Office Action rejected claims 62-64, 66, 67, 69-72, 74, 75, 77-79, 81, 82 and 84-90 under 35 U.S.C. § 112, second paragraph, as indefinite. Specifically, the Examiner asserts that while claim 61 recites a “computer readable storage medium,” the dependent claims refer to a “computer readable medium.” Applicant has amended the dependent claims in accordance with the Examiner’s suggestion and submits that the 35 U.S.C. § 112, second paragraph, rejection has been overcome.

Section 101 Rejection:

The Office Action rejected claims 61-64, 66, 67, 69-72, 74, 75, 77-79, 81, 82 and 84-90 under 35 U.S.C. § 101 on the grounds that they include non-statutory subject matter. Specifically, although claim 61 recites a computer-readable storage medium, the Examiner asserts that this feature is “not explicitly defined by the applicant’s specification.” Office Action at 3. Applicant traverses this rejection for at least the following reasons.

First, Applicant submits that the subject matter of claim 61 and its dependent claims is statutory on its face. That is, claim 61 specifically recites a storage medium, which is statutory. The fact that the specification provides for a broader class of “computer readable media” that includes both storage and transmission media does not preclude a claim that is narrower in scope than is provided in the specification. Applicants note that the specification does not state that a storage medium is or includes a

transmission medium. In fact, a storage medium cannot be equivalent to a transmission medium, since a transmission medium inherently does not perform a storage function.

Second, Applicant submits that numerous different embodiments of storage media are disclosed in Applicant's specification. As the Examiner notes, the specification provides that "a computer readable medium may include storage media such as magnetic or optical media . . . [or] volatile or non-volatile media such as RAM." Specification at para. [0090] (emphasis added). Applicant notes that while storage media are not limited to the particular embodiments disclosed, each of the disclosed embodiments is clearly an example of a computer readable storage medium.

Applicant therefore submits that the subject matter of claim 61 and its dependent claims is both statutory and adequately supported by the specification, and respectfully requests that the 35 U.S.C. § 101 rejection be withdrawn.

Section 103(a) Rejections:

The Office Action rejected claims 1-4, 6, 7, 9-12, 14, 15, 17-19, 21, 22, 24-29, 31-34, 36, 37, 39-42, 44, 45, 47-49, 51, 52, 54-59, 61-64, 66, 67, 69-72, 74, 75, 77-79, 81, 82 and 84-89 under 35 U.S.C. § 103(a) as being unpatentable over Shah et al. (U.S. Patent 7,039,922) [hereinafter Shah] in view of Jibbe (U.S. Patent 6,367,033) [hereinafter Jibbe], and claims 30, 60, and 90 under 35 U.S.C. § 103(a) as being unpatentable over Shah and Jibbe in view of Lee et al. (U.S. Patent No. 6,889,380) [hereinafter Lee]. While Applicant traverses these rejections, Applicant has amended the independent claims for further clarity, and submits that the cited references fail to disclose all of the features of the independent claims for at least the following reasons.

1. The cited references fail to disclose bringing online or taking offline one or more fabric-attached mass storage devices.

Claim 1 requires, in part, a host system dynamically changing its fabric device configuration in response to an event indicating a fabric state change for one or more host adapter ports, where dynamically changing the fabric device comprises the host system bringing online or taking offline one or more fabric-attached mass storage devices for the one or more host adapter ports for the host system.

In rejecting claim 1, the Examiner asserts that Shah discloses this feature. Office Action at 5. In particular, the Examiner asserts that Shah discloses that “said host system dynamically changing comprises the host system bringing online . . . or taking offline . . . one or more devices for the one or more host adapter ports.” *Id.* (emphasis added). The Examiner contends that Shah’s discussion of adding or removing I/O controllers discloses the recited feature.

Applicant submits that the purported claim language the Examiner is addressing does not in fact correspond to the language of claim 1. That is, claim 1 does not read “bringing online or taking offline one or more devices.” but instead is directed to “bringing online or taking offline one or more fabric-attached mass storage devices.” As previously argued, the I/O controllers discussed in Shah are in no way identical to or suggestive of fabric-attached mass storage devices. The controller-level operation described in Shah is fundamentally distinct from the mass-storage-device level operation required by claim 1.

As previously noted, Shah is directed to a fabric-based cluster interface for interfacing hosts with fabric-attached input/output (I/O) controllers. Shah, Abstract. Shah discloses a typical embodiment that includes hosts 210 and 212, a fabric 202, and I/O units 1 and 2 coupled to fabric 202. *Id.* at Fig. 2 & col. 3, lines 29-67. In turn, I/O units 1 and 2 couple to I/O controllers 1-3, which couple to a number of fabric or I/O devices 222, 224, 232, 234. Shah discloses that the fabric or I/O devices may encompass “storage devices” such as hard drives or tape drives.

As shown in Fig. 2 and alternative embodiments shown in Figs. 3-4, Shah clearly distinguishes between I/O units, I/O controllers and the fabric devices that are managed by the I/O controllers. Further, **the entire discussion of fabric management in Shah takes place at the level of I/O units and controllers, not fabric-attached mass storage devices.** Shah discloses a central network manager 710 including fabric services 712 and I/O controller manager 714. *Id.* at Fig. 7, col. 8, line 24 – col. 10, line 62. Shah describes fabric services 712 as being configured to detect the attachment of I/O units 1 and 2 to fabric 202 and to assign a network address (e.g., a Media Access Control (MAC) address) to the attached I/O units. *Id.* at col. 8, lines 48-53. Subsequently to a MAC address being assigned, Shah describes I/O controller manager 714 as being configured to identify the I/O controllers connected to the I/O unit, such as by querying the individual I/O units. *Id.* at col. 8, lines 64-67. After identifying the attached I/O controllers, Shah discloses that I/O controller manager 714 is configured to determine which hosts are allowed to access each of the I/O controllers and to send messages to the hosts indicating the I/O controllers they may access. *Id.* at col. 9, lines 9-29.

Nowhere within the disclosure does Shah specify that any types of fabric management tasks, such as bringing online or taking offline, are performed by a host system at the level of the fabric-attached mass storage devices themselves. Rather, the level of management granularity described by Shah is restricted to that of I/O controllers, which as shown in Fig. 2 may control more than one fabric device. Assigning MAC addresses to I/O units and assigning I/O controllers of those I/O units to hosts, as described by Shah, is in no way suggestive of a host system dynamically changing its fabric device configuration in response to receiving a fabric state change event, where changing the fabric device configuration comprises the host system bringing online or taking offline one or more fabric-attached mass storage devices for the one or more host adapter ports for the host system, as required by Applicant's claim 1. Aside from mentioning that fabric devices may include storage devices, Shah does not mention any details of device-level configuration or operation. Further, the device-level configuration required by claim 1 cannot be fairly implied from the controller-level configuration

disclosed by Shah, since these two types of configuration pertain to completely different levels within the fabric hierarchy.

2. The cited references fail to disclose creating or deleting within an operating system executing on the host system an operating system node corresponding to a fabric-attached mass storage device.

Claim 1 requires, in part, that bringing online and taking offline respectively comprise creating or disabling, within an operating system executing on the host system, an operating system node corresponding to each of the one or more fabric-attached mass storage devices being brought online or taken offline. In rejecting claim 1, the Examiner relies upon Shah to disclose this feature, asserting that Shah's fabric bus driver 620 provides the corresponding functionality. Office Action at 5-6.

Applicant traverses the Examiner's assertion and notes that, as with the claim limitation addressed above, the features in question do not pertain merely to "fabric devices" being brought online or taken offline, as asserted by the Examiner. Rather, claim 1 explicitly recites that the operating system node that is created or disabled specifically corresponds to one of the fabric attached mass storage devices that is being brought online or taken offline. Shah's fabric bus driver 620 operates only to detect the presence of fabric-attached and local I/O controllers. Shah at col. 8, lines 8-23. As noted above, I/O controllers are distinct in kind from fabric-attached mass storage devices. Moreover, a system that is configured to operate at the level of I/O controllers, as in Shah, suggests nothing regarding a system that is configured to operate at the level of individual mass storage devices, since these are fundamentally different types of operational modes.

3. The cited references fail to disclose the recited operating system node.

Claim 1 requires, in part, that each given operating system node provides a communication interface to a given corresponding fabric-attached mass storage device,

and wherein an application running on said host system is configured to communicate with said given corresponding fabric-attached mass storage device through said given operating system node. In rejecting claim 1, the Examiner acknowledges that Shah fails to disclose this feature, and relies instead on Jibbe. Office Action at 6. In particular, the Examiner refers to Jibbe's host-side hub 110, which "may involve a node capable of routing traffic to host-side monitor and analyzer 125." Jibbe at col. 5, lines 8-10. The Examiner further quotes language from Jibbe in which "the functionality of host-side monitor and analyzer 125 may be built into one of host computer 105's host adapters." Jibbe at col. 5, lines 17-20.

Applicant traverses the Examiner's assertions. The "node" described in Jibbe is clearly part of a hardware device: the host-side hub 110. Moreover, host-side hub 110 is distinct from the host systems 105 shown in Jibbe. Jibbe, Fig. 1. By contrast, claim 1 requires an operating system node that is created or disabled within an operating system executing on the host system. Jibbe does not describe an entity that is capable of being "created" in the manner required by claim 1. Moreover, Jibbe's implementation of host-side monitor and analyzer 125 within a host computer's host adapter is simply irrelevant to the substance of claim 1, as the host-side monitor and analyzer of Jibbe does not participate as part of the communication path through which an application and a fabric-attached mass storage device communicate, as required by claim 1. Rather, as its name suggests, this functionality monitors and analyzes bus traffic.

Applicant note that the respective features of claim 1 omitted from Shah and Jibbe as demonstrated above are absent from the other cited references. Similar arguments apply to independent claims 31 and 61, which recite features similar to claim 1. Therefore, for at least the foregoing reasons, Applicant submits that the rejection of independent claims 1, 31, and 61 is unsupported. Applicant also notes that the rejections of various ones of the dependent claims are further unsupported by the cited references. However, as the rejection of the independent claims has been shown to be unsupported, further discussion of the dependent claims is unnecessary at this time.

CONCLUSION

Applicants submit the application is in condition for allowance, and notice to that effect is respectfully requested.

If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5181-83600/RCK.

Respectfully submitted,

/Robert C. Kowert/

Robert C. Kowert, Reg. #39,255
Attorney for Applicant

Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C.
P.O. Box 398
Austin, TX 78767-0398
Phone: (512) 853-8850

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